AMENDMENTS TO THE CLAIMS:

LISTING OF THE CLAIMS:

The following listing of claims will replace all prior versions, and listings, of claims in the present application.

1. – 8. (Canceled)

9. (Currently Amended) A [[The]] proton beam target for generating gamma rays in response to an impinging proton beam comprising: ~~of claim 8~~

a thin ^{13}C Diamond gamma reaction layer for generating the gamma rays therefrom; and

a stopping layer for mitigating transmission of the proton beam therethrough, wherein thermal dissipation in said target under proton beam exposure is improved, wherein the stopping layer comprises a SiC substrate.

10. (Currently Amended) The proton beam target of claim [[8]] 9, wherein the thin ^{13}C Diamond gamma reaction layer is deposited on said stopping layer via a plasma assisted CVD process.

11. (Currently Amended) The proton beam target of claim [[8]] 9, wherein the thin ^{13}C Diamond gamma reaction layer is less than about 30 μm thick.

12. (Currently Amended) The proton beam target of claim [[8]] 9, wherein the ~~stopping layer comprises a~~ SiC substrate is brazed to a surface of a cooling support fabricated from a low z, high thermal conductivity material.

13. (Original) The proton beam target of claim 12, wherein said cooling support dissipates heat energy away from the stopping layer, said stopping layer being attached to the cooling support and is interposed between the ^{13}C Diamond gamma reaction layer and the cooling support.

14. – 17. (Canceled)

18. (Original) A method of fabricating a proton beam target for generating gamma rays which are reflected therefrom in response to an impinging proton beam, the method comprising the steps of:

(a) forming a stopping layer comprising a SiC substrate for mitigating transmission of the proton beam therethrough; and

(b) attaching a thin ^{13}C Diamond gamma reaction layer to the stopping layer for generating the gamma rays therefrom in response to the impinging proton beam, said stopping layer being chemically reactive with the ^{13}C Diamond.

19. (Original) The method of claim 18, wherein the thin ^{13}C Diamond gamma reaction layer is attached to the stopping layer via a plasma assisted CVD process.

20. (Original) The method of claim 18, further comprising the step of:

(c) attaching the stopping layer onto a cooling support for dissipating heat energy away from the stopping layer.

21. (Original) The method of claim 18, wherein the stopping layer is attached to the cooling support via brazing.

22. – 24. (Canceled)

25. (Original) A contraband detection system comprising:

a means for producing a high energy beam of protons at a specific energy with a very narrow energy spread;

a proton beam target for generating gamma rays in response to impinging high energy beam of protons, said resultant gamma rays being preferentially absorbed by a targeted contraband material; and,

a plurality of detector means for detecting absorption of said gamma rays indicating presence of said targeted contraband material, wherein said proton beam target comprises:

a thin ^{13}C Diamond gamma reaction layer for generating the gamma rays therefrom; and

a stopping layer comprising a SiC substrate for mitigating transmission of the

proton beam therethrough, wherein thermal dissipation in said target under proton beam exposure is improved.

26. (Original) The contraband detection system of claim 25, wherein the means for producing a high energy beam of protons comprises an RF accelerator.

27. (Currently Amended) The contraband detection system of claim [[22]] 25, wherein the detector means for detecting absorption of said gamma rays comprises nitrogenous liquid scintillator detectors.